

## SEQUENCE LISTING

<110> Carter Holt Harvey Limited  
 Tasman Biotechnology Limited  
 Michigan Technological University  
 Podila, Gopi Krishna  
 Liu, Jun-Jun  
 Karnosky, David F

<120> Plants Having Modified Reproductive Activity

<130> 25635 MRB

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<150> NZ334715

<151> 1999-03-17

<160> 17

<170> PatentIn Ver. 2.1

<210> 1

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<212> DNA

<213> Pinus radiata

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<213> Pinus radiata

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<221> CDS

<222> (1)..(669)

<223> Pinus radiata MADS box protein mRNA, complete cds

<300>

&lt;301&gt; Jun-Jun, Liu

Podila, G K.

&lt;302&gt; Not applicable

&lt;303&gt; Direct submission

&lt;304&gt; -

&lt;305&gt; -

&lt;306&gt; ---

&lt;307&gt; 1997-09-09

&lt;308&gt; Genbank AF023615

&lt;309&gt; 1999-01-26

&lt;313&gt; 1 TO 909

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cga cag gtc act ttc tgc aag cgc cga aat ggt tta tta aag aag gcg	96
Arg Gln Val Thr Phe Cys Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala	
20 25 30	

tat gaa tta tca gtt ctt tgt gat gca gaa gtg gcc ctc atc gtc ttc	144
Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe	
35 40 45	

tcc agc aga ggg aga ctt tat gaa ttt gcc aac cac agc gtg aag agg	192
Ser Ser Arg Gly Arg Leu Tyr Glu Phe Ala Asn His Ser Val Lys Arg	
50 55 60	

acg att gag agg tac aag aag act tgc gtt gac aac aac cac gga ggg	240
Thr Ile Glu Arg Tyr Lys Lys Thr Cys Val Asp Asn Asn His Gly Gly	
65 70 75 80	

gcg ata tca gag tcc aat tct cag tat tgg caa cag gag gct ggt aaa	288
Ala Ile Ser Glu Ser Asn Ser Gln Tyr Trp Gln Gln Glu Ala Gly Lys	
85 90 95	

ctc aga caa cag att gac att ttg caa aat gca aat agg cat ttg atg	336
Leu Arg Gln Gln Ile Asp Ile Leu Gln Asn Ala Asn Arg His Leu Met	
100 105 110	

ggg gac ggg ctt aca gct ttg aac att aag gaa ctc aag caa ctt gag	384
Gly Asp Gly Leu Thr Ala Leu Asn Ile Lys Glu Leu Lys Gln Leu Glu	
115 120 125	

gtt cga ctt gaa aaa gga atc agc cga gtg cga tcc aaa aag aac gag	432
Val Arg Leu Glu Lys Gly Ile Ser Arg Val Arg Ser Lys Lys Asn Glu	
130 135 140	

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 Met Leu Leu Glu Glu Ile Asp Ile Met Gln Arg Arg Glu His Ile Leu  
 145 150 155 160

atc cag gag aat gag att ctt cgc agc aag ata gcc gag tgt cag aat 528  
 Ile Gln Glu Asn Glu Ile Leu Arg Ser Lys Ile Ala Glu Cys Gln Asn  
 165 170 175

agc cac aac acg aac atg tta tca gct ccg gaa tat gat gca ctg ccc 576  
 Ser His Asn Thr Asn Met Leu Ser Ala Pro Glu Tyr Asp Ala Leu Pro  
 180 185 190

gca ttc gac tct cga aat ttc cta cat gca aat cta atc gat gcg gcc 624  
 Ala Phe Asp Ser Arg Asn Phe Leu His Ala Asn Leu Ile Asp Ala Ala  
 195 200 205

cat cac tat gca cat cag gaa caa aca acg ctt cag ctt ggc tga 669  
 His His Tyr Ala His Gln Glu Gln Thr Thr Leu Gln Leu Gly  
 210 215 220

acgttgaagc ggtggacgct taaaactcaa tcaaggcacc cgaaaaatat gctagtaacc 729

ttgaatgaga ttcagagtcg aaatattgcg aggcaagagc acaatggaag agatagctcc 789

tagtatgaat atggatttat gatattaaca tatggtttgt cagctttaaa tatagctgtt 849

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<210> 4

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 Tyr Glu Leu Ser Val Leu Cys Asp Ala Glu Val Ala Leu Ile Val Phe  
 35 40 45  
 Ser Ser Arg Gly Arg Leu Tyr Glu Phe Ala Asn His Ser Val Lys Arg  
 50 55 60  
 Thr Ile Glu Arg Tyr Lys Lys Thr Cys Val Asp Asn Asn His Gly Gly  
 65 70 75 80  
 Ala Ile Ser Glu Ser Asn Ser Gln Tyr Trp Gln Gln Glu Ala Gly Lys  
 85 90 95

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Leu Arg Gln Gln Ile Asp Ile Leu Gln Asn Ala Asn Arg His Leu Met
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Gly Asp Gly Leu Thr Ala Leu Asn Ile Lys Glu Leu Lys Gln Leu Glu
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Val Arg Leu Glu Lys Gly Ile Ser Arg Val Arg Ser Lys Lys Asn Glu
      130                      135                      140
Met Leu Leu Glu Glu Ile Asp Ile Met Gln Arg Arg Glu His Ile Leu
145                      150                      155                      160
Ile Gln Glu Asn Glu Ile Leu Arg Ser Lys Ile Ala Glu Cys Gln Asn
      165                      170                      175
Ser His Asn Thr Asn Met Leu Ser Ala Pro Glu Tyr Asp Ala Leu Pro
      180                      185                      190
Ala Phe Asp Ser Arg Asn Phe Leu His Ala Asn Leu Ile Asp Ala Ala
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His His Tyr Ala His Gln Glu Gln Thr Thr Leu Gln Leu Gly
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<212> DNA

<213> Arabidopsis thaliana

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<221> CDS

<222> (16)..(795)

<223> Arabidopsis thaliana ribonuclease (RNS2) mRNA,  
complete cds

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<301> Taylor, C B.

Bariola, P A.

delCardayre, S B.

Raines, R T.

Green, P J.

<302> RNS2: a senescence-associated RNase of Arabidopsis that  
diverged from the S-RNases before speciation

<303> Proc. Natl. Acad. Sci. U.S.A.

<304> 90

<305> 11

<306> 5118-5122

<307> 1993

<308> Genbank

<309> 1994-10-30

<313> 1 TO 1012

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Cys Ile Ala Gly Ala Phe Ala Gly Asp Val Ile Glu Leu Asn Arg Ser
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cag agg gag ttc gat tat ttc gct cta tct ctt caa tgg cct gga acc 147
Gln Arg Glu Phe Asp Tyr Phe Ala Leu Ser Leu Gln Trp Pro Gly Thr
      30                35                40

tat tgc cgt gga act cgc cat tgt tgc tcc aaa aac gct tgc tgc aga 195
Tyr Cys Arg Gly Thr Arg His Cys Cys Ser Lys Asn Ala Cys Cys Arg
      45                50                55                60

ggc tcc gat gct cca act caa ttc aca att cat ggg tta tgg cct gac 243
Gly Ser Asp Ala Pro Thr Gln Phe Thr Ile His Gly Leu Trp Pro Asp
            65                70                75

tat aac gat ggt tgc tgg cct tca tgt tgt tat cga tct gac ttt aaa 291
Tyr Asn Asp Gly Ser Trp Pro Ser Cys Cys Tyr Arg Ser Asp Phe Lys
            80                85                90

gag aag gag att tca acg ttg atg gat ggt ctt gag aag tac tgg cct 339
Glu Lys Glu Ile Ser Thr Leu Met Asp Gly Leu Glu Lys Tyr Trp Pro
            95                100                105

agt ctc agt tgt ggt tct cca tca tca tgc aat ggt ggg aaa ggg tca 387
Ser Leu Ser Cys Gly Ser Pro Ser Ser Cys Asn Gly Gly Lys Gly Ser
            110                115                120

ttt tgg ggc cac gag tgg gag aaa cat ggg act tgt tct tct cct gtt 435
Phe Trp Gly His Glu Trp Glu Lys His Gly Thr Cys Ser Ser Pro Val
      125                130                135                140

ttt cat gat gag tat aat tac ttc ctt acc aca ctt aat ctc tac ttg 483
Phe His Asp Glu Tyr Asn Tyr Phe Leu Thr Thr Leu Asn Leu Tyr Leu
            145                150                155

aag cat aat gtc acg gat gtc ctt tat caa gct ggc tat gtt gct tcc 531
Lys His Asn Val Thr Asp Val Leu Tyr Gln Ala Gly Tyr Val Ala Ser
            160                165                170

aac agt gaa aag tat cct cta gga ggt atc gta aca gcc att cag aat 579
Asn Ser Glu Lys Tyr Pro Leu Gly Gly Ile Val Thr Ala Ile Gln Asn
            175                180                185

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gaa ata cgt ata tgc ttc tat aaa gat ttt aag ccc agg gac tgt gtt 675
Glu Ile Arg Ile Cys Phe Tyr Lys Asp Phe Lys Pro Arg Asp Cys Val
205                210                215                220

ggg tca caa gat ttg aca tct aga aag tca tgc ccc aag tac gta agt 723
Gly Ser Gln Asp Leu Thr Ser Arg Lys Ser Cys Pro Lys Tyr Val Ser
                225                230                235

ttg ccg gaa tac acg cca tta gat ggt gaa gct atg gtt ctg aag atg 771
Leu Pro Glu Tyr Thr Pro Leu Asp Gly Glu Ala Met Val Leu Lys Met
                240                245                250

cca aca gaa aga gaa gct ctt tga atcggaag atgggagctt tggtatcttc 825
Pro Thr Glu Arg Glu Ala Leu
      255                260

tgagagacaa tacatacatg tctctgatgt tgtaacttta ctacaaaac ctataaagat 885

tggccttattt cgttctattg gatatgtatc atcattactg gtaaatacaag tttctttcta 945

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aaaaaaaaa 1012

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&lt;211&gt; 259

&lt;212&gt; PRT

&lt;213&gt; Arabidopsis thaliana

&lt;400&gt; 6

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Ala Phe Ala Gly Asp Val Ile Glu Leu Asn Arg Ser Gln Arg Glu Phe
      20              25              30
Asp Tyr Phe Ala Leu Ser Leu Gln Trp Pro Gly Thr Tyr Cys Arg Gly
      35              40              45
Thr Arg His Cys Cys Ser Lys Asn Ala Cys Cys Arg Gly Ser Asp Ala
      50              55              60
Pro Thr Gln Phe Thr Ile His Gly Leu Trp Pro Asp Tyr Asn Asp Gly
      65              70              75              80
Ser Trp Pro Ser Cys Cys Tyr Arg Ser Asp Phe Lys Glu Lys Glu Ile
                85              90              95
Ser Thr Leu Met Asp Gly Leu Glu Lys Tyr Trp Pro Ser Leu Ser Cys

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Tyr	Asn	Tyr	Phe	Leu	Thr	Thr
145			150		155	
Thr	Asp	Val	Leu	Tyr	Gln	Ala
	165		170		175	
Tyr	Pro	Leu	Gly	Gly	Ile	Val
	180		185		190	
Thr	Pro	Glu	Val	Val	Cys	Lys
	195		200		205	
Cys	Phe	Tyr	Lys	Asp	Phe	Lys
	210		215		220	
Leu	Thr	Ser	Arg	Lys	Ser	Cys
225			230		235	
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&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence:Made in lab

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&lt;222&gt; (3)

&lt;223&gt; i

&lt;220&gt;

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&lt;222&gt; (6)

&lt;223&gt; i

&lt;220&gt;

&lt;221&gt; modified\_base

&lt;222&gt; (9)

&lt;223&gt; i

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<212> DNA

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<223> Description of Artificial Sequence:Made in lab

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<212> DNA

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<212> DNA

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WO 00/55172

PCT/NZ00/00031

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